

Application No.: 09/111833

Case No.: 49360US015

**Remarks**

The Examiner is thanked for the courteous interview that occurred on November 24, 2003, and for the opportunity to correct the deficiencies noted in the application in the Office Action mailed September 23, 2003. As indicated at the interview, applicants' product-by-process claims define a product that is different from electret filter media products heretofore known. Applicants' product has distinctly different properties from known filter media products and therefore is patentable over such known art. As indicated in Applicants' Amendment mailed December 19, 2003, applicants have shown that its electret filter media web exhibits quality factors that are an improvement over previously known webs. When the properties of a product that is claimed in a "product-by-process" fashion exhibits distinctly different properties, its subject matter is patentable<sup>1</sup> and the scope of the issued claim is governed by the actual product and not the process.

Applicants are using the product-by-process format for claiming the present invention because of difficulties in describing the final product by other means. As indicated at the interview, applicants indicated that they would submit a 132 declaration to demonstrate differences between the prior art product and applicants' product. Attached is a Declaration of Marvin Jones. This Declaration was filed in a preceding application, Serial No. 08/865,362, which is now U.S. Patent 6,119,691. As the Jones Declaration dated May 16, 1997 indicates, products of the present invention exhibit a different charge configuration from previously known electret filter media products. The difference in charge configuration is also illustrated by the quality factor data as set forth in his Declaration, as well as in the working examples of the present application. Applicants highlighted the different performance properties in the previous Amendment filed on December 19, 2003. In view of the different charge configuration and the different performance and the beneficial performance features of the invention, applicants' claimed products would not have been obvious to a person of ordinary skill within the meaning of 35 USC § 103.

Respectfully submitted,

March 15, 2004

Date

By: 

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<sup>1</sup> See, *In re Thorp*, 777 F.2d 195, 227 USPQ 964, 966 (Fed. Cir. 1985) ("We also agree that on the entirety of the record the PTO had correctly adduced a *prima facie* case, and that the burden had shifted to Thorpe, "to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product.").

PATENT  
DOCKET NO. 49360USA9D

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	Group Art Unit: unknown
Angadjivand et al.	)	
	)	Examiner: unknown
Serial No. unknown	)	
Filed: herewith	)	
	)	

For: ELECTRET FILTER MEDIA (as amended)

DECLARATION OF MARVIN JONES UNDER 37 C.F.R. §1.132

1. I am a named inventor on U.S. Patent No. 5,496,507, from which the present application claims priority.

2. The webs identified in Table 1 below were prepared as in the corresponding Examples of set forth in the present application and retested for penetration (Pen(%)) and quality factor (QF) as described in the section entitled DOP Penetration and Pressure Drop. Sample C12 corresponds to the web of Examples 1-7 prior to charging. The penetration (Pen(%)) and quality factor (QF) are reported in Table 1. The test results generally correspond to the testing of earlier examples.

Table 1

Example	Charging Method	Penetration (Pen%)	Quality Factor (QF)
C12	uncharged	78	0.10
C1	hydrocharged @ 34.5 kPa	61	0.20
C2	hydrocharged @ 68.9 kPa	41	0.33
1	hydrocharged @ 172.4 kPa	20	0.61
3	hydrocharged @ 689.4 kPa	17	0.64
7	hydrocharged @ 3447.1 kPa	21	0.54
C3	corona charged	25	0.54

U.S. Serial No. unknown  
 Declaration of Marvin Jones under 37 C.F.R. §1.132  
 Filed: herewith  
 Page 2 of 4

C4	corona/hydro @ 68.9 kPa	8.5	1.09
8	corona/hydro @ 172.4 kPa	5.3	1.28
10	corona/hydro @ 689.4 kPa	4.2	1.37
14	corona/hydro @ 3447.1 kPa	6.7	1.05
15	corona/hydro @ 4136.5 kPa	8.5	0.97
C6	corona charged	67	0.8
22	corona/hydro @ 689.4 kPa	53	1.56

3. Electric charge in webs may be polarized, unpolarized, or a combination thereof, depending upon the composition of the web and the method by which the web is charged. Figures 5A-C are idealized cross-sectional illustrations of the charge configurations in webs subject to 1) corona charging, 2) corona charging pre-treatment followed by hydrocharging, and 3) hydrocharging with no pre-treatment. One side of the corona charged web of Figure 5A has a predominantly positive charge and the other side has a predominantly negative charge producing a net polarization along the thickness of the web. Pre-treating the web with corona charging followed by hydrocharging produces a combination of polarized and unpolarized charge, as illustrated in Figure 5B. The macroscopic polarization of the web of Figure 5B is significantly less than that of the pure corona charged web of Figure 5A. An external discharge current is observable by thermally stimulated discharge for samples that contain electric charges with a net polarization normal to the plane of the electrodes, such as with corona charged samples of Figures 5A and 5B.

4. The hydrocharged web of Figure 5C illustrates unpolarized positive and negative trapped charge dispersed throughout the thermoplastic fibers. The randomly deposited, unpolarized charge produces almost zero net polarization across the media. Little or no external discharging current is detectable using thermally stimulated discharge.

5. It has been determined that polarization of the electric charge can be induced in a hydrocharged web containing unpolarized charge by redistributing separately trapped positive and

U.S. Serial No. unknown  
Declaration of Marvin Jones under 37 C.F.R. §1.132  
Filed: herewith  
Page 3 of 4

negative charge by elevating the temperature to some level above  $T_g$  and cooling the samples in the presence of an electric field to "freeze-in" the resulting electric charge polarization of the trapped charge. The designation  $T_g$  corresponds to the glass transition temperature where a polymer changes from a viscous or rubbery condition to a hard and relatively brittle one. The instrument used for generating the electric field was a Solomat TSC/RMA model 91000 with a pivot electrode, distributed by TherMold Partners, L.P., Thermal Analysis Instruments of Stanford, CT. Samples 3, C3, C12 and 10 of Table 1 (3505G polypropylene) were poled by applying a DC field with  $E_{max} = 2.5$  KV/mm at 100°C for 5, 10 15, 20 and 25 minutes.

6. Thermally stimulated discharge currents may be measured on an electret by heating the electret material at a constant heating rate and measuring the current generated in an external circuit by migration of charge species inside the electret. The peak (current maximum) position and shape of the discharge current are characteristics of the mechanism by which the charges have been stored in the electret. For electrets that contain a real charge, the peak maximum and shape are related to the configuration (ordering) of the charge implanted in the electret material. The amount of charge produced in the outside circuit due to movement of the electret charge to a lower energy state upon heating can be determined by integration of the discharge peak(s).

7. Thermally stimulated discharge analysis involves reheating the electret web so that the frozen charge regains mobility and moves to some lower energy configuration, thereby generating a detectable external discharge current. After poling in the DC field mentioned above, the webs of Samples 3, C3, C12 and 10 of Table 1 were reheated from -50°C to 160°C at a heating rate of 3°C per minute. The external current generated was measured as a function of temperature. The total amount of charge produced in the external circuit by electret charge redistribution upon heating was obtained by calculating the area under the discharging peaks.

8. Exhibit A shows the measured electric charge density (total measured electric charge divided by the surface area of the electrodes) as a function of the poling time for sample webs made from the 3505G polypropylene of Examples 1-7. As shown in Exhibit A, the measured charge density on the hydrocharged sample 3 is much higher than that obtained from

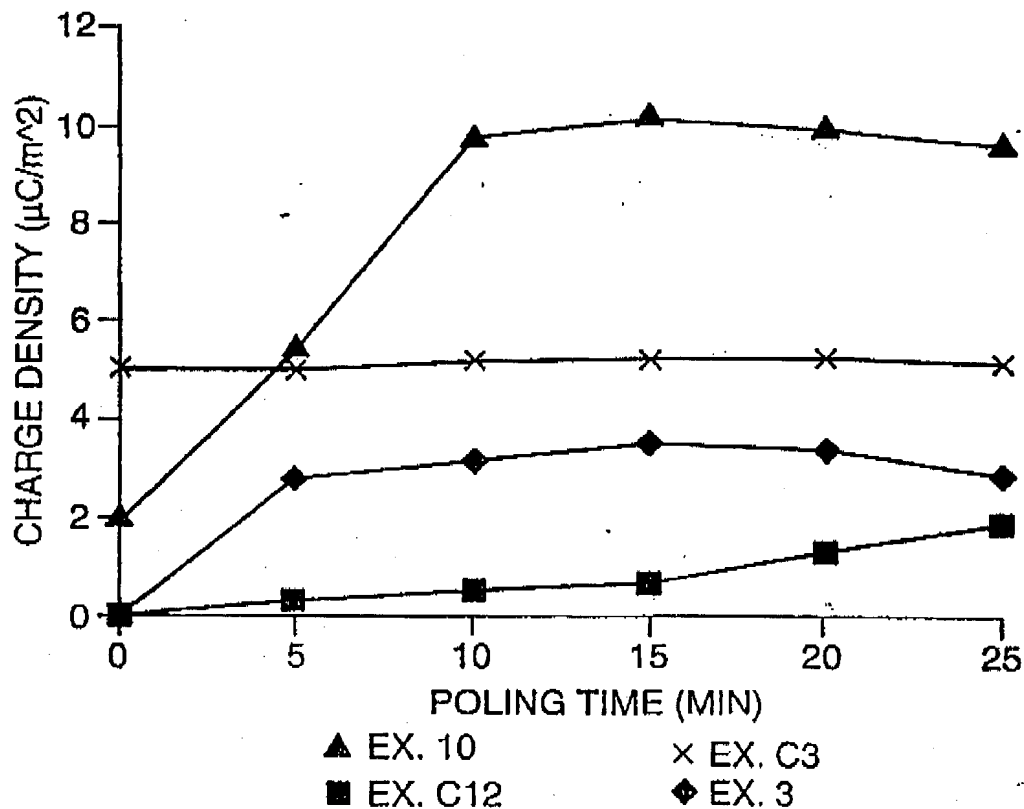
U.S. Serial No. unknown  
Declaration of Marvin Jones under 37 C.F.R. §1.132  
Filed: herewith  
Page 4 of 4

uncharged webs C12, which supports Applicants supposition that hydrocharging results in the addition or redistribution of charge in the fibers. The hydrocharged polypropylene web of sample 3 had a detectable charge density of zero at zero poling. The measured charge density of the corona charged sample C3 was not affected by poling. The combination of corona charging prior to hydrocharging sample 10 produced a measured charge density after poling approximately twice that of corona charging alone.

9. I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further, that these statements are made with the knowledge that willful false statements, and the like so made, are punishable by fine or imprisonment, or both, under Section 1001, Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

May 16 1997  
Date

Marvin E. Jones  
Marvin E. Jones



## EXHIBIT A